1. An apparatus for lossless compression of bi-tonal raster data, the apparatus comprising:

a data channel configured to carry a raster data stream;

a plurality of pattern detection modules, including an edge pattern detection module, operably connected to the data channel and configured to receive raster data, each of the pattern detection modules further configured to detect a separate type of pattern in the raster data, each pattern capable of a separate lossless representation; and

a formatting module configured to place the lossless representations into a compressed data stream.

2. The apparatus of claim 1, further comprising a pattern selection module configured to select the lossless representation that is most compact.

3. The apparatus of claim 1, wherein one of the patterns comprises verbatim data, and further comprising a verbatim data transfer module configured to receive raster data, and provide verbatim raster data, the verbatim raster data being an identical and lossless representation of the raster data.

4. The apparatus of claim 1, wherein the plurality of pattern detection modules further comprises a solid pattern detection module.

5. The apparatus of claim 1, wherein the plurality of pattern detection modules further comprises a half-tone pattern detection module.

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5. The apparatus of claim 1, wherein the plurality of pattern detection modules further comprises a half-tone pattern detection module.

6. The apparatus of claim 1, wherein the formatting module is configured to segment the compressed raster stream into a plurality of packets, each packet comprising a fixed length header field and a variable length data field.

7. The apparatus of claim 6, wherein the fixed length header field is configured to contain a plurality of codes representing a plurality of pattern types corresponding to the plurality of pattern detection modules.

8. The apparatus of claim 7, wherein the plurality of codes comprises a 00 code representing a solid ON pattern, a 01 code representing a solid OFF pattern, a 10 code representing an edge pattern, and a 11 code representing verbatim raster data.

9. The method of claim 7, wherein the plurality of codes comprises a 0 code representing solid patterns, and 1 code representing other patterns.

10. The apparatus of claim 1, further comprising a plurality of pattern extraction modules configured to extract the selected lossless representations from the data channel.

11. The apparatus of claim 1, wherein the pattern detection modules and the formatting module are configured to detect and format the raster data in a single pass.

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12. An apparatus for decompressing losslessly compressed bi-tonal raster data the apparatus comprising:

a data channel configured to carry a compressed raster data stream;

a plurality of decompression modules operably connected to the data channel and configured to generate raster data from compressed raster data, one of the decompression modules being a verbatim data transfer module configured to generate raster data that is identical to the compressed raster data, another decompression module being an edge pattern generation module; and

a pattern decoding module configured to receive a pattern identifier and activate one of the plurality of decompression modules.

13. The apparatus of claim 12, wherein the plurality of pattern generators further comprises a solid pattern generator.

14. The apparatus of claim 12, wherein the plurality of pattern generators further comprises a half-tone pattern generator.

15. The apparatus of claim 12, further comprising a deformatting module configured to parse packets, each packet comprising a fixed length header field and a variable length data field.

16. The apparatus of claim 15, wherein the fixed length header field is configured to contain a plurality of codes representing a plurality of patterns corresponding to the plurality of decompression modules.

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17. The apparatus of claim 16, wherein the plurality of codes comprises a 00 code representing a solid ON pattern, a 01 code representing a solid OFF pattern, a 10 code representing an edge pattern, and a 11 code representing verbatim raster data.

18. The method of claim 17, wherein the plurality of codes comprises a 0 code representing solid patterns, and a 1 code representing other patterns.

19. A method for lossless compression of bi-tonal raster data, the method comprising:

receiving a raster data stream containing raster data;

detecting a plurality of patterns in the raster data, including edge patterns; and

generating lossless representations of the raster data based upon the plurality of patterns.

20. The method of claim 19, wherein detecting a plurality of patterns and generating the lossless representations are conducted in a single pass.

21. The method of claim 19, wherein detecting a plurality of patterns further comprises detecting solid patterns.

22. The method of claim 19, wherein detecting a plurality of patterns further comprises detecting half-tone patterns.

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23. The method of claim 19, further comprising selecting the lossless representations to be generated based upon a criterion of compactness.

24. The method of claim 19, further comprising formatting the lossless representations into packets, each packet comprising a fixed length header field and a variable length data field.

25. The method of claim 24, wherein formatting the compressed raster stream further comprises placing a plurality of codes in the packets, each code of the plurality of codes representing one of a plurality of patterns.

26. The method of claim 25, wherein the plurality of codes comprises a 00 code representing a solid ON pattern, a 01 code representing a solid OFF pattern, a 10 code representing an edge pattern, and a 11 code representing verbatim raster data.

27. The method of claim 25, wherein the plurality of codes comprises a 0 code representing solid patterns, and 1 code representing other patterns.

28. A method for decompressing losslessly compressed bi-tonal raster data, the method comprising:

receiving a pattern identifier and pattern data;

providing a plurality of pattern generation procedures including an edge pattern generation procedure; and

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executing a pattern generation procedure selected according to the pattern identifier to provide decompressed raster data from the pattern data.

29. The method of claim 28, wherein executing a pattern generation procedure comprises executing a solid pattern generation procedure.

30. The method of claim 28, wherein executing a pattern generation procedure comprises executing a half-tone pattern generation procedure.

31. The method of claim 30, wherein executing the half-tone pattern generation procedure comprises indexing a codebook.

32. The method of claim 28, further comprising deformatting the packets, including deformatting a fixed length header field and a variable length data field.

33. The method of claim 32, wherein the fixed length header field is configured to contain a plurality of codes representing a plurality of patterns corresponding to the plurality of decompression modules.

34. The method of claim 33, wherein the plurality of codes comprises a 00 code representing a solid ON pattern, a 01 code representing a solid OFF pattern, a 10 code representing an edge pattern, and a 11 code representing verbatim raster data.

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35. The method of claim 33, wherein the plurality of codes comprises a 0 code representing solid patterns, and a 1 code representing other patterns.

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